

methods, I still am bold enough to ask whether anything can be "more misleading and inaccurate" than the formula for reduction for temperature and pressure given in both editions of his "Organic Chemistry" under the description of Dumas's vapour-density method. And to add that no excuse can here be found of a correction given elsewhere, or of the fact that it may be desirable sometimes to state a case broadly to begin with and to define it more closely afterwards.

HENRY E. ROSCOE

The Tangent-Galvanometer

ATTENTION has recently been drawn more than once (notably by Sir William Thomson, and by Mr. W. H. Preece and Mr. Kemp) to the advantages offered, in certain cases of the use of the tangent-galvanometer, by placing the instrument so that the plane of the coils makes a greater or less angle with the plane of the magnetic meridian. It may not be amiss, therefore, to point out that, in 1869, M. Bertin showed that the sensitiveness of the tangent-galvanometer for strong currents may be increased and the usable range of deflection doubled by placing the circle in a vertical plane inclined at an angle of 45° to the magnetic meridian (*Annales de Chimie et de Physique*, 4th series, vol. xiv, p. 27).

When readings are taken with the current traversing the galvanometer, first in one direction and then in the other, as would always be done if accuracy were important, the expression for the strength of current is almost as simple when the coils make an angle with the magnetic meridian as when they are parallel to it. In the former case the strength of current is

$$C = \frac{1}{2} k \cos \alpha (\tan \theta + \tan \theta'),$$

where α is the (fixed) angle between the plane of the coil and the magnetic meridian, and θ and θ' the deflections of the needle from the plane of the coil due to the current in the two directions. θ is reckoned positive in the direction from the plane of the coil towards the plane of the meridian, and θ' is reckoned in the opposite direction. To determine the angle α we have

$$\tan \alpha = \frac{1}{2} (\tan \theta - \tan \theta'),$$

and it is probably most convenient to determine the numerical value of $\cos \alpha$ in the first expression from this by tables. If the current be adjusted so as to make the second deflection $\theta' = 0$, we have simply $\tan \alpha = \frac{1}{2} \tan \theta_1$, if θ_1 be the corresponding deflection with the current reversed.

G. CAREY FOSTER

University College, London, September 30

Alligators in the Bahamas

IN Catesby's "Natural History of Florida, Carolina, and the Bahama Islands," published in the latter half of the eighteenth century, the author, usually a most accurate observer, states that the mangrove-swamps on the Island of Andros presented a loathsome appearance owing to the remains of fish having been left there, half eaten, by the *alligators*. During a fairly complete exploration of Andros, which I made in the early part of last year, I observed no traces of these animals, though, as I was not then aware of Catesby's statement, I did not make any special search for them. In response, however, to inquiries made in the local paper, I lately received from the Rev. W. L. de Glanville, Rector of Inagua, Bahamas, a letter from which the following is an extract:—

"Legendary stories of alligators having been floated to this island on logs of mahogany are numerous here. I have not succeeded in verifying any of them. On July 21, while on a visit to our North-West Point Settlement, a man exhibited to me the skin of an alligator which he had shot a day or two previously. Length all over, from tip to tip, 8 feet; from line at right angles to tip of snout to angle of jaw, 13 inches; greatest frontal diameter, about 11 inches.

"Logs of mahogany have been drifted recently on these shores, but no one saw an alligator arrive. That shot was on shore, and seen more than once."

As the distance from this to Inagua is more than 400 miles, I have not been able to make inquiries on the spot. But there seems to be no doubt that the alligator must have been carried by the current from the south-east on a log of mahogany or other wood from San Domingo to Inagua. It seems likely that alligators have frequently been drifted to that island, though the absence of a suitable environment has prevented their surviving. The conditions in Andros would suit them better, since

about that island there is a considerable extent of fresh and brackish water in lakes, lagoons, and creeks. But it is not easy to understand how they could arrive at Andros, unless we suppose that the Gulf Stream carried them from the north-west coast of Cuba and cast them on the west side of the Great Bahama Bank, whence small local currents and the wind might bring them to the west side of Andros. The distance travelled would in this case be about 300 miles, or about twice as great as that from San Domingo to Inagua.

I trust that this note may be useful as affording further proof of the fact that oceanic currents take some part in the dispersion of even large animals.

JOHN GARDINER

Nassau, Bahamas, September 15

Meteors—The September Taurids

ON September 22, 1886, 10h. 26m., I observed a fine meteor about equal to Jupiter, pursuing a path of some 7° in the extreme east region of Aries. It left a streak and moved somewhat slowly, being evidently foreshortened near its radiant point in Taurus. At 10h. 46m. the same night I noticed another meteor from the same direction.

On September 21, 1879, I counted 92 meteors, including several from this radiant in Taurus, and on September 22, 1884, two others were seen amongst 29 registered on that date.

A comparison of the paths shows a well-defined radiant at $63^\circ + 23'$ (about 8° N.N.W. of Aldebaran), and I believe the shower is rather an important one, though not well visible until late in the night.

I have recognised several radiants from this position in Taurus in October and November, and in August Mr. Greg derived a shower at $64^\circ + 22'$ from the observations in 1867-74, collected by the Luminous Meteor Committee of the British Association. On October 17-19, 1877, I found a radiant at $63^\circ + 22'$; on November 20, 1876, at $62^\circ + 22\frac{1}{2}'$; and on November 27, 1880, at $63^\circ + 21'$. There are also many other contemporary showers slightly south-west at about $59^\circ + 20'$, and it is in November that the display of meteors from Taurus reaches a maximum.

In September, during the last half of the month, I have determined some other showers in the region of Taurus, supplying meteors of much the same character. The chief additional centres of radiation seem to be at $74^\circ + 14'$, $70^\circ + 4'$, and $53^\circ + 3'$, and there is a fairly active shower also from a point further east, at $89^\circ + 19'$, in Orion. The first of these, near 11 Orionis, was splendidly defined from 8 bright meteors on September 27, 1886; and on September 22, 1871, Lieut.-Col. Tupman saw it at $75^\circ + 15'$. The Orionids at $89^\circ + 19'$ were well seen in September 1877, and confirmed in September 1884, but this is essentially a morning shower, as the radiant does not reach a fair altitude for the dispersion of its meteors until the few hours preceding sunrise.

W. F. DENNING

Bristol, October 3

Action of Light upon Diastases

IN 1878, in conjunction with Mr. T. P. Blunt (*Proc. Roy. Soc. No. 191*), I showed that the *invertive ferment* of cane-sugar is destroyed by oxidation on prolonged exposure to sunlight. Lately I have extended this observation to other ferments of the like kind, with similar result.

Twenty-five cubic centimetres of very active solutions of *malt diastase*, *pancreatic diastase*, and *trypsin* respectively were rendered inert by insolation in 50 cc. flasks for one month (August 25 to September 25).

A solution of *pepsin* was likewise destroyed, but in this case the ferment had been badly prepared, and was not very potent to commence with.

On the other hand, 25 cubic centimetres of solution of *rennet*, though distinctly enfeebled by insolation, still retained its specific properties at the end of the month. This immunity, however, was only relative, for a more dilute solution in a shallower stratum was almost entirely destroyed by one week's exposure to light (August 31 to September 7).

In all cases the contents of similar flasks kept under like conditions of temperature, &c., but in the dark, were found to be still active at the termination of the experiment.

In determining the peptonising power of the trypsin and pepsin, Grützner's method (carmin-stained fibrin) was very useful. I find, however, that it is more convenient and econo-

mical to keep the prepared fibrin by drying it in a current of air than to preserve it under ether, as usually recommended.

September 27

ARTHUR DOWNES

Note on Actinometry by Oxalic Acid

OXALIC acid is entirely oxidised by light (*Proc. Roy. Soc. No. 191*, and *Chemical News*, October 8, 1880), and affords, by reason of its own physical properties and those of the products of the reaction, an excellent medium for actinometry. A preliminary series of experiments on the physical conditions which modify this oxidation show that, *c.p.*, the effect is greater in direct proportion to the extent of exposed surface of the solution but inversely as its depth. It is greater also in proportion to the strength of the solution; and it would appear—I speak for the present quite provisionally—that in this relation the reaction follows a definite law, being as the square root of the mass.

September 27

ARTHUR DOWNES

Humming in the Air caused by Insects

IN a letter to the Hon. Daines Barrington (letter lxxx.) the Rev. Gilbert White, the well-known author of the "Natural History of Selborne," mentions a strange humming sound in the air. He writes:—"There is a natural occurrence to be met with upon the highest parts of our downs in hot summer days which always amuses me much without giving me any satisfaction with respect to the cause of it: and that is a loud audible humming as of bees in the air, though not one insect is to be seen. This sound is to be heard distinctly the whole common through from the Money Dells to my avenue gate. Any person would suppose that a large swarm of bees was in motion, and playing about over his head. This noise was heard last week on June 28."

It is singular that no explanation has been offered by any one for such a common phenomenon. I am convinced that the humming sound mentioned by Gilbert White was nothing more than the noise occasioned by the vibrations of millions of insects' wings in the air. In hot summer evenings in particular I have heard these peculiar humming sounds, and know them to be caused by immense hordes of gnats and midges which fill the air with their numbers.

W. HARCOURT BATH

The Limes, Sutton Coldfield, near Birmingham, October

Mimicry in Snakes

A CURIOUS fact has been lately brought to my notice by a friend of mine, Mr. H. M. Oakley, in connection with the *Dasyptis scaber*, Linn., or egg-eating snake—the "Eijer eter" of the Dutch colonists—which, if not already well known, may prove of interest to some of your readers. The specimen obtained by Mr. Oakley was caught at Hout Bay some twenty miles from Cape Town, and is about 3 feet in length, and its size, markings, and colour bear sufficient resemblance to those of the Berg Adder (*Crotalus atropos*, Linn.) to be easily mistaken for that snake. It also has keeled scales, generally characteristic, at the Cape, of venomous species. Its head has, however, the long lacertine shape distinctive, here, of harmless snakes, but, when aroused and alarmed or irritated, it flattens it out until it assumes the usual viperine shape of the "club" in a playing card. It then coils as for a spring, erects its head with every appearance of anger, produces a hissing noise with its scales, not unlike the hiss of a puff adder or cobra, and darts forward as if to strike its fangs into its foe, and in every way exactly simulates the motions of an irritated berg adder. This snake has, however, neither fangs nor teeth (which, indeed, would not be required for egg-swallowing), and is not poisonous, a fact which was placed beyond doubt by Mr. Oakley repeatedly placing his finger in the reptile's mouth. This seems a clear instance of mimicry of another species for defensive purposes, but I am not aware of another instance among ophidians.

W. HAMMOND TOOKE

Cape Town, Cape of Good Hope, September 8

THE COLONIAL AND INDIAN EXHIBITION

CONTINUING our review of the most noteworthy or interesting vegetable products now being exhibited at South Kensington, we find in close contiguity to those from British Guiana, described in NATURE, July 15, p. 242, the exhibits from

Mauritius.—The entire collection, though not large, is one of some interest, and the vegetable kingdom plays by far the most important part in the exhibits. The collection of fibres will attract attention as much for its completeness as for the care with which they have been prepared. Many are of scientific interest only, being obtained from plants that could never be turned to commercial account, such, for instance, as *Hyophorbe Verschaffeltii*, *Latania commersonii*, *Lodoicea sechellarum*, *Macrozamia spiralis*, &c. This collection is exhibited by the Botanical Gardens, as is also a collection of woods of similar interest. Some notes on these woods are useful. Thus, we are told that *Tecoma pentaphylla* has a soft white wood, not much used, and that it is a moderate-sized shade-tree of rapid growth. Samples of the wood, however, grown in the West Indies, show a close and even grain, and are fairly hard—so hard, indeed, as to suggest its suitability for wood-engraving, for which purpose it has been tried in this country, and though not by any means equal to box-wood, was reported upon as likely to be found useful for some kinds of work. The soft wood of *Ficus mauritiana* is used in the colony both for firewood and for hollowing out for canoes, while the hard wood of the Ebony (*Diospyros Ebenum*), which is described as being either black or sometimes streaked with yellow and brown, is used for inlaying, furniture, and ornamental turnery. The Bois Maigre (*Nuxia verticillata*) is said to produce a short-grained timber which decomposes rapidly, but when young it makes excellent walking-sticks, which are much sought for. *Terminalia Benzoin*, a large tree, which has become scarce in Mauritius, produces a wood valued for many purposes. It would seem that the wood is sometimes fragrant, for it is said that "some parts of the tree were once much burnt in Mauritius as an incense." Another odoriferous wood is *Noronhia Broomieana*, called here Bois Sandal. The Carambole (*Averrhoa Carambola*), valued in India for the sake of its acid fruits, is planted in Mauritius for the same purpose, the fruits being eaten either raw or made into tarts.

Probably the exhibits that attract most attention in the Mauritius Court are the fine samples of vanilla pods, covered as they are with an abundant coating of crystals, and shedding forth, even through the glass cases which cover them, the delicate fragrance for which vanilla is celebrated.

Seychelles.—Amongst these exhibits the Double Cocoa-Nut, or Cocoa de Mer (*Lodoicea sechellarum*) is the most prominent. The double form of the fruit, which is its normal condition, is well shown, as well as a triple-lobed nut, which is not very uncommon. Here also are fine samples of vanilla, nearly, if not quite, equal to those from Mauritius. Dried papaw juice and some remarkably good specimens of essential oils are shown, all of which are extremely creditable to the colony.

Cyprus.—The vegetable products shown in this Court are not numerous, nor is there anything of novelty excepting perhaps a peculiar black substance described as honey, from the Carob or Locust Bean (*Ceratonia Siliqua*). The pods themselves are also exhibited, and their production, it seems, has greatly increased in recent years, stimulated by an increasing demand, especially in this country, where they are used very largely in making the patent compound cattle-foods, in consequence of their saccharine and nutritious character. Low freights have much encouraged the trade in carobs, enabling shippers to sell them at moderate prices. The quantity of carobs exported from Cyprus in 1884 amounted to 30,000 tons, about one-half of which came to England. The finest quality is produced in Limassol and Lefcara, and obtain relatively higher prices than those of Kyrenia. The average price realised for these pods is about 3*l.* per ton.

Another product of great importance to Cyprus up to